**ELECTRICAL PROPERTIES OF THIN FILMS CdTe DOPED Ca AND Li**

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This paper describes a technique for obtaining thin layers of cadmium telluride p-type conductivity by chemical doping of the surface of CdTe crystals with calcium and lithium. The dependences of the electrical properties of the obtained films on the technological factors of their production are investigated.

As base substrates for obtaining the doped films were used 5×5×2 mm3 plates, which were cut from a CdTe bulk crystal. The plates were mechanically and chemically polished before doping. Doping was carried out by boiling the substrates in aqueous suspensions of Ca(NO3)2, LiNO3. The duration of doping process varied from 15 to 60 min. The surface layers change the electronic conductivity to the hole, which is confirmed by a change in the sign of thermo-emf. Measurement of electrical parameters of semiconductor films was carried out on the developed automated device according to the classical method, when a sufficiently high voltage is applied to the sample and the current flowing through the sample is measured.

Since doping only affects the conductivity of the surface layer, the rectangular sample can be considered within the electrical engineering model [1] compared to the impurity distribution over the depth determined from the diffusion equation.

In particular, the parameters of the surface layer and the diffusion coefficient are determined, which are given in Table. 1. The resistivity of the non-alloy material was 6.9·105Ohm·cm.

Table 1

Parameters doped thin film of CdTe: Ca

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| The concentration of the solution | % | 25 | 50 | 75 |
| Specific resistance of film | ρg, Ohm·cm | 600 | 900 | 2400 |
| Concentration Ca in the film | N, sm-3 | 1,5·1020 | 3,0·1020 | 4,5·1020 |
| Diffusion coefficient Ca in CdTe | D, sm2/s | 3,00·10-12 | | |

Similar studies were performed for cadmium telluride doped with lithium ions.

1 V.V. Prokopiv, O.B. Kostyuk, B.S. Dzundza, T.M. Mazur, L.V. Turovska, O.M. Matkivskyi, M.V. Deychakivskyi. Electrical properties of CdTe<Ca> thin layers, Physics and Chemistry of Solid State, **2019**, 20(4), p. 372-375.